Claims

[c1]   What is claimed is:

1.A real-time remote backup system used in a network system connecting at least one source computer system and one destination computer system, each computer system consisting of a kernel space and a user space, and the backup system comprising:

a loadable kernel module that pre-sets up at least a specific system call within the kernel space of the source computer system, receiving a notification generated from the pre-set system call to generate a corresponding file modification message when while a file modification event occurs in the user space of the source computer system;

a scheduling module queuing each said file modification message from the loadable kernel module, and then generating a corresponding backup command in response to the each file modification message; and

at least one network backup unit installed in the source computer system, in accordance to a file information provided within the backup command, backing-up the variant part of the file through the network system to the destination computer system when receiving each

backup command transmitted from the scheduling module.

[c2]   2.The backup system of claim 1 wherein the loadable kernel module further comprises a replacement unit for replacing an original system call in the source computer system to the specific system call.

[c3]   3.The backup system of claim 2, further including a graphical user interface (GUI)having an automatic network backup switch for providing the user to switch on/off an automatic network backup function, so that the replacement unit of the loadable kernel module will replace back to the original system call when the automatic network backup function is switched off.

[c4]   4.The backup system of claim 1 wherein the loadable kernel module further comprises:
a call determining unit determining whether the specific system call is one of a plurality of predetermined system calls; and
a message processing unit generating the file modification message to the scheduling module, according to determination of the call determining unit that the specific system call is one of a plurality of predetermined system calls.

[c5]   5.The backup system of claim 1 wherein the file modifi-
cation message comprises at least a filename and path of
the modified file.

[c6]   6.The backup system of claim 1, wherein the scheduling
module further comprises a queue unit for accommodat-
ing the file modification messages in sequence from the
loadable kernel module.

[c7]   7.The backup system of claim 6, wherein the scheduling
module further comprises a schedule managing unit for
queuing sequentially each said message into the queue
unit, and a schedule processing unit for sequentially
reading the messages out the queue unit and transmit-
ting the backup commands according to the messages.

[c8]   8.The backup system of claim 7 wherein the schedule
managing unit and the schedule processing unit use the
same algorithm.

[c9]   9.The backup system of claim 8 wherein the algorithm
used by both the schedule managing unit and the sched-
ule processing unit is in coordination with an algorithm
used by the network backup unit to prevent data from
losing during the transmission process of said message
and command.

[c10]   10.The backup system of claim 9 wherein the schedule

managing unit and the schedule processing unit respect-fully have at least one specific thread for defining an ad-justable optimized time interval.

[c11]   11.The backup system of claim 1 wherein the backup command comprises at least the path of the varied file.

[c12]   12.The backup system of claim 1 wherein the destination computer system further comprises another one same network backup unit for receiving backup data from the source computer system.

[c13]   13.A real-time remote backup system installed in a source computer system connected to a destination computer system through a network system, each com-puter system comprising at least one kernel space for a kernel and a user space for a network backup unit, and the backup system comprising:
a loadable kernel module that pre-sets up at least one specific system call in the kernel space of the source computer system, determining generation of a corre-sponding file modification message, according to the type of the system call, to notify the kernel when a file modification event occurs in the user space of the source computer system; and
a scheduling module sequentially queuing and process-ing each said file modification message transmitted from

the loadable kernel module to generate a corresponding backup command to facilitate that the network backup unit of the source computer system backs-up the modified file to the destination computer system through the network system.

[c14] 14.The backup system of claim 13, wherein the file modification message comprises at least a filename and a path of the modified file.

[c15] 15.The backup system of claim 13, wherein the backup command comprises at least a path of the modified file.

[c16] 16.A method of real-time remote backup used in a network system interconnecting between at least one source computer system and one destination computer system, each computer system consisting of a kernel space and a user space, and the method comprising:
implementing a specific system call that is pre-loaded by a loadable kernel module in the kernel space of the source computer system, to notify a kernel of the source computer system of a file modification event when the file modification event occurs in the user space of the source computer system;
the loadable kernel module being notified of said file modification event to determine whether a file modification message should be generated with reference to the

type of the specific system call, as soon as the specific system call is implemented;

queuing in sequence each said file modification message into a queue unit;

sequentially taking and processing the file modification messages from the queue unit to generate a corresponding backup command; and

a network backup unit backing-up the modified part of the file to the destination computer system, through the network, according to the backup command.

[c17]   17.The method of claim 16, wherein the file modification message comprises at least a filename and a path of the modified file.

[c18]   18.The method of claim 16, wherein the backup command comprises at least a path of the modified file.

[c19]   19.The method of claim 16, wherein the loadable kernel module generates the file modification message or terminates the process if determining the system call is one of predetermined system calls.